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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/960,530	09/21/2001	Martin Keller	015258-053900US	8279

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EXAMINER
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CREPEAU, JONATHAN

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 04/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/960,530

Applicant(s)

KELLER ET AL.

Examiner

Jonathan S. Crepeau

Art Unit

1746

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 September 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4 and 7-10 is/are rejected.
- 7) ☒ Claim(s) 3, 5 and 6 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>9-21-01</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Suggestions***

1. The clarity of claim 2 may be improved by amending or deleting the phrase “in particular” in the second-to-last line. Correction is suggested but not required.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 4 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by WO 98/45890. Koschany (U.S. Patent 6,376,110) is taken as an English equivalent of WO '890. Regarding claims 1 and 10, Koschany '110 is directed to a plant comprising a fuel cell stack. Regarding claims 1 and 4, the fuel cell stack is operated by measuring two parameters (AC voltage and AC current) and determining the real part of the impedance (i.e., the internal resistance) therefrom (see col. 3, lines 43-52; col. 4, lines 1-21). The value of the internal resistance corresponds to the moisture of the electrolyte, which can be characterized as the “integrity state” or “quality” of the fuel cell. The fuel cell is controlled so as to optimize water

content and power output (see col. 3, line 1). Regarding claim 10, the control is performed by a control device (30) and an adaptation device (valve 31) (see col. 5, line 9).

Thus, the instant claims are anticipated.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 98/45890 in view of Hart-Predmore et al (U.S. Patent 6,436,561).

WO '890 (Koschany) does not expressly teach that the system comprises a combustor for burning effluent gases or that such combustor comprises a temperature sensor, as recited in claims 2 and 7.

Hart-Predmore et al. is directed to a method of using a combustor in a fuel cell system (see abstract). In column 9, line 67, the reference teaches that the combustor comprises a thermocouple (i.e., thermo-generator) for detecting the catalyst bed temperature.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated by the disclosure of Hart-Predmore et al. to use a combustor having a thermocouple in the system of

Koschany. In column 2, line 17, Hart-Predmore et al. teach that “it would be desirable to provide a method of controlling a combustor in a fuel cell system which makes efficient use of all available fuel.” Accordingly, the artisan would be motivated to use a combustor having a thermocouple in the system of Koschany and controlling the combustor in the manner suggested by Hart-Predmore et al.

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 98/45890 in view of Hart-Predmore et al. as applied to claims 2 and 7 above, and further in view of Wunning (U.S. Patent 5,154,599).

Hart-Predmore does not expressly teach that the combustor comprises a UV probe, as recited in claim 8.

Wunning is directed to a method for combusting fuel. The reference teaches a combustor UV sensor in column 4, line 17 et seq.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the disclosure of Wunning would motivate the artisan to use a UV probe in the combustor of Hart-Predmore et al. In column 4, line 29, Wunning teaches that “in that kind of combustion, the appearance of a UV signal indicates that the flame is burning stably, while the UV signal disappears when the flame goes out.”

Accordingly, the artisan would be motivated to use a UV sensor in the combustor of Hart-Predmore et al. in hopes of observing and maintaining flame stability.

7. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 98/45890 in view of Hart-Predmore et al. as applied to claims 2 and 7 above, and further in view of Fujita et al (U.S. Patent 6,386,862).

Hart-Predmore does not expressly teach that the combustor comprises a CO sensor, as recited in claim 9.

Fujita is directed to a catalytic combustor. In column 5, line 9, the reference teaches that the combustor comprises a CO sensor.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the disclosure of Fujita would motivate the artisan to use a CO sensor in the combustor of Hart-Predmore et al. In column 5, line 3, Fujita et al. teach that “in the case of abnormal combustion other than combustion with lack of oxygen, the abnormality can be detected with a gas sensor such as a CO sensor.” Accordingly, the artisan would be motivated to use a CO sensor in the combustor of Hart-Predmore et al. in hopes of detecting abnormalities in the combustor.

*Allowable Subject Matter*

8. Claims 3, 5, and 6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter:

Claim 3 recites, among other features, that a mathematical relationship exists between the internal resistance and an amount of fuel fed into the fuel cell, and that the parameters  $c_j$ ,  $d_j$  are proportionality factors or exponents in this relationship. Koschany, the closest prior art, teaches the control of a reactant flowrate based on the water content (i.e., internal resistance) value (see col. 5, line 9 set seq.), but does not teach or fairly suggest the claimed “mathematical relationship” wherein  $c_j$  and  $d_j$  (i.e., AC current and AC voltage) are used as proportionality factors or exponents. Accordingly, claim 3 contains allowable subject matter.


Claim 5 recites, among other features, that a table of values of  $c_j$ ,  $d_j$  is determined based on plurality of fuel cells having different integrity states ( $j$ ), and that these values are used to control the fuel cell instead of the diagnostically measured values. Koschany, the closest prior art, also does not teach or fairly suggest this subject matter. Accordingly, claim 5 also contains allowable subject matter.

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*Conclusion*

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski, can be reached at (571) 272-1302. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (703) 872-9306.



Jonathan Crepeau  
Patent Examiner  
Art Unit 1746  
March 30, 2004